CLAIM AMENDMENTS

This listing of claims will replace all prior versions and listings of claims in the application.

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1. (Currently Amended) A method of characterizing a content traffic flow at communication nodes of a communications network for communications network Service Level Agreement (SLA) compliance assessment by a ~~central entity~~ network management system (NMS) connected to said communication nodes, the method comprising:

at least one of said communication nodes tracking cumulative content arrivals, in real time, for the content traffic flow to derive a time variation of cumulative content arrivals;

said at least one of said nodes adjusting characteristic arrival curve parameters, the arrival curve parameters comprising at least ~~a slope and an ordinate intercept~~ b, a degree of burst transmission, r, a sustainable content conveyance rate, M, a maximum packet size, and p, a peak content conveyance rate, in fitting an arrival curve to the variation of cumulative content arrivals for the content traffic flow; and

said at least one of said nodes reporting said adjusted arrival curve parameters to said ~~central entity~~ NMS to enable said ~~central entity~~ NMS to carry

17 out said SLA compliance assessment with respect to the content traffic flow,

18 thereby reducing reporting bandwidth overhead by minimizing an amount of

19 content arrival information communicated to said ~~central entity~~ NMS.

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1 2.   (Currently Amended) The method of providing a content traffic flow

2 characterization as claimed in claim 1, wherein reporting arrival curve parameters

3 to the ~~central entity~~ NMS is carried out in real time, and reporting is limited to

4 arrival curve parameters only.

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1 3.   (Previously Presented) The method claimed in claim 1, further comprising:

2 said at least one of said nodes including a timestamp specifying the time of

3 the arrival curve fit.

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1 4.   (Currently Amended) The method claimed in claim 1, further comprising:

2 said at least one of said nodes receiving a request for an arrival curve

3 parameter update;

4 reporting arrival curve parameters to the ~~central entity~~ NMS only in

5 response to a request; and

6 further providing a reduction in the reporting bandwidth overhead.

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1 5.   (Previously Presented) The method claimed in claim 1, further comprising:

2 said at least one of said nodes tracking one of cumulative received packets,

3 bits, bytes, words, and double words.

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1 6-7. (Canceled).

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1 8. (Previously Presented) The method claimed in claim 1, further comprising:

2 said at least one of said nodes fitting the arrival curve in accordance with one

3 of a shifted linear regression procedure, and a convex hull fitting procedure.

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1 9-11. (Canceled).

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1 12. (Currently Amended) A method of assessing communications network

2 conformance to a Service Level Agreement (SLA) in respect of a content traffic flow

3 at communication nodes of a communications network, the method comprising:

4 receiving from at least one of said communication nodes an arrival curve

5 parameter report in respect of a tracked content traffic flow in real time;

6 computing a resource utilization related value based on the received arrival

7 curve parameter report in respect of a content traffic flow pattern and at least one

8 service curve; and

9 providing a communications network SLA conformance assessment to a

10 network management system (NMS) based on the computed resource utilization

11   related value, wherein receiving arrival curve parameters, the arrival curve

12   parameters comprising at least b, a degree of burst transmission, r, a sustainable

13   content conveyance rate, M, a maximum packet size, and p, a peak content

14   conveyance rate a slope and an ordinate intercept, only enables the provision of a

15   real-time scalable communications network SLA conformance assessment solution

16   while reducing reporting bandwidth overhead by minimizing an amount of content

17   arrival information communicated by said at least one of said nodes.

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1   13.   (Currently Amended) The method claimed in claim 12, further comprising:

2   a central entity the NMS requesting an arrival curve parameter report from

3   said one of said nodes.

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1   14.   (Previously Presented) The method claimed in claim 12, further comprising:

2   retrieving the at least one service curve from storage in respect of the content

3   traffic flow.

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1   15.   (Previously Presented) The method claimed in claim 12, further comprising:

2   retrieving the at least one service curve from said at least one node, said at

3   least one node being in a path of the content traffic flow.

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1   16.   (Previously Presented) The method claimed in claim 12, further comprising:

2   retrieving from storage a sequence in which multiple service curves are to be

3   combined with the arrival curve parameters in respect of the content traffic flow.

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1   17.   (Previously Presented) The method claimed in claim 12, further comprising:

2   discovering a sequence in which multiple service curves are to be combined

3   with the arrival curve parameters in respect of the content traffic flow.

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1   18.   (Previously Presented) The method claimed in claim 12, further comprising:

2   computing Quality-of-Service (QoS) parameters.

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1   19.   (Previously Presented) The method claimed in claim 12, further comprising:

2   convolving an arrival curve respecting the received arrival curve parameters

3   with a service curve.

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1   20.   (Previously Presented) The method claimed in claim 12, further comprising:

2   comparing the computed resource utilization related value with a

3   corresponding agreed upon resource utilization value.

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1   21.   (Previously Presented) The method claimed in claim 12, further comprising:

2   selectively modifying communications network operational parameters to

3   ensure that the resource utilization values comply with agreed upon SLA resource

4   utilization values.

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1   22.   (Previously Presented) The method claimed in claim 12, further comprising:

2   selectively modifying SLA specified resource utilization values to ensure that

3   the current communications network operation is accommodated in the SLA.

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1   23.   (Previously Presented) The method claimed in claim 12, further comprising:

2   providing a proposal for traffic content redirection onto one of existing

3   infrastructure and new to be deployed infrastructure.

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1   24.   (Canceled)

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1   25.   (Currently Amended) A method of centrally assessing communications

2   network conformance to a Service Level Agreement (SLA) in respect of a content

3   traffic flow at least one of a plurality of communication nodes of a communications

4   network, the method comprising:

5   said at least one communication node tracking cumulative content arrivals

6   for the content traffic flow, in real-time, to derive a time variation of cumulative

7   content arrivals at a communications network node;

8   said at least one of said nodes adjusting arrival curve parameters, the arrival

9   curve parameters comprising at least b, a degree of burst transmission, r, a

10   sustainable content conveyance rate, M, a maximum packet size, and p, a peak

11   content conveyance rate, a slope and an ordinate intercept in fitting an arrival

12   curve to the variation of cumulative content arrivals for the content traffic flow;

13   said at least one node reporting, in real time, the arrival curve parameters to

14   a central entity network management system (NMS) assessing communications

15   network SLA conformance with respect to the content traffic flow;

16   said central entity NMS receiving an arrival curve parameter report in

17   respect of a tracked content traffic flow from said at least one network node in real-

18   time;

19   computing a resource utilization related value based on the received arrival

20   curve parameter report in respect of a content traffic flow pattern and at least one

21   service curve; and

22   providing a communications network SLA conformance assessment based on

23   the computed resource utilization related value[[,]]; and

24   employing arrival curve parameter reporting greatly reducing resource

25   overheads in providing communications network SLA conformance assessments.

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1   26.   (Previously Presented) The method claimed in claim 25, further comprising:

2   said at least one of said nodes including a timestamp specifying the time of

3   the arrival curve fit.

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1   27.   (Currently Amended) The method claimed in claim 26, further comprising:

2   said at least one of said nodes receiving a request for an arrival curve

3   parameter update;

4   reporting arrival curve parameters to the ~~central entity~~ NMS only in

5   response to a request; and

6   further providing a reduction in the reporting bandwidth overhead.

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1   28.   (Previously Presented) The method claimed in claim 25, further comprising:

2   said at least one of said nodes tracking one of cumulative received packets,

3   bits, bytes, words, and double words.

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1   29-30. (Canceled)

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1   31.   (Previously Presented) The method claimed in claim 25, further comprising:

2   said at least one of said nodes fitting the arrival curve in accordance with one

3   of a shifted linear regression procedure, and a convex hull fitting procedure.

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1   32.   (Previously Presented) The method claimed in claim 25, further comprising:

2   requesting an arrival curve parameter report from said at least one of said

3   nodes.

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1   33.   (Previously Presented) The method claimed in claim 25, further comprising:

2   retrieving the at least one service curve from storage in respect of the content

3   traffic flow.

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1   34.   (Previously Presented) The method claimed in claim 25, further comprising:

2   retrieving the at least one service curve from said at least one node, said at

3   least one node being in a path of the content traffic flow.

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1   35.   (Previously Presented) The method claimed in claim 25, further comprising:

2   retrieving from storage a sequence in which multiple service curves are to be

3   combined with the arrival curve parameters in respect of the content traffic flow.

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1   36.   (Previously Presented) The method claimed in claim 25, further comprising:

2   discovering a sequence in which multiple service curves are to be combined

3   with the arrival curve parameters in respect of the content traffic flow.

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1   37.   (Previously Presented) The method claimed in claim 25, further comprising:

2   computing Quality-of-Service (QoS) parameters.

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1   38.   (Previously Presented) The method claimed in claim 25, further comprising:

2   convolving an arrival curve respecting the received arrival curve parameters

3   with a service curve.

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1   39.   (Previously Presented) The method claimed in claim 25, further comprising:

2   comparing the computed resource utilization related value with a

3   corresponding agreed upon resource utilization value.

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1   40.   (Previously Presented) The method claimed in claim 25, further comprising:

2   selectively modifying communications network operational parameters to

3   ensure that the resource utilization values comply with agreed upon SLA resource

4   utilization values.

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1   41.   (Previously Presented) The method claimed in claim 25, further comprising:

2   selectively modifying SLA specified resource utilization values to ensure that

3   the current communications network operation is accommodated in the SLA.

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1   42.   (Previously Presented) The method claimed in claim 25, further comprising:

2   providing a proposal for traffic content redirection onto one of existing

3   infrastructure and new to be deployed infrastructure.

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1   43.   (Canceled).

1   44.   (Previously Presented) The method as claimed in claim 1, wherein said

2   tracking, adjusting, and reporting are carried out by more than one of said

3   communication nodes.

1   45.   (Previously Presented) The method as claimed in claim 12, wherein said

2   arrival curve parameter report is received from more than one of said

3   communication nodes.

1   46.   (Previously Presented) The method as claimed in claim 25, wherein said

2   tracking, adjusting, and reporting are carried out by more than one of said

3   communication nodes, and said arrival curve parameter report is received from

4   more than one of said communication nodes.

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